No. 5510-A

Service Manual

KODAK

CHEVRON

CAMERA

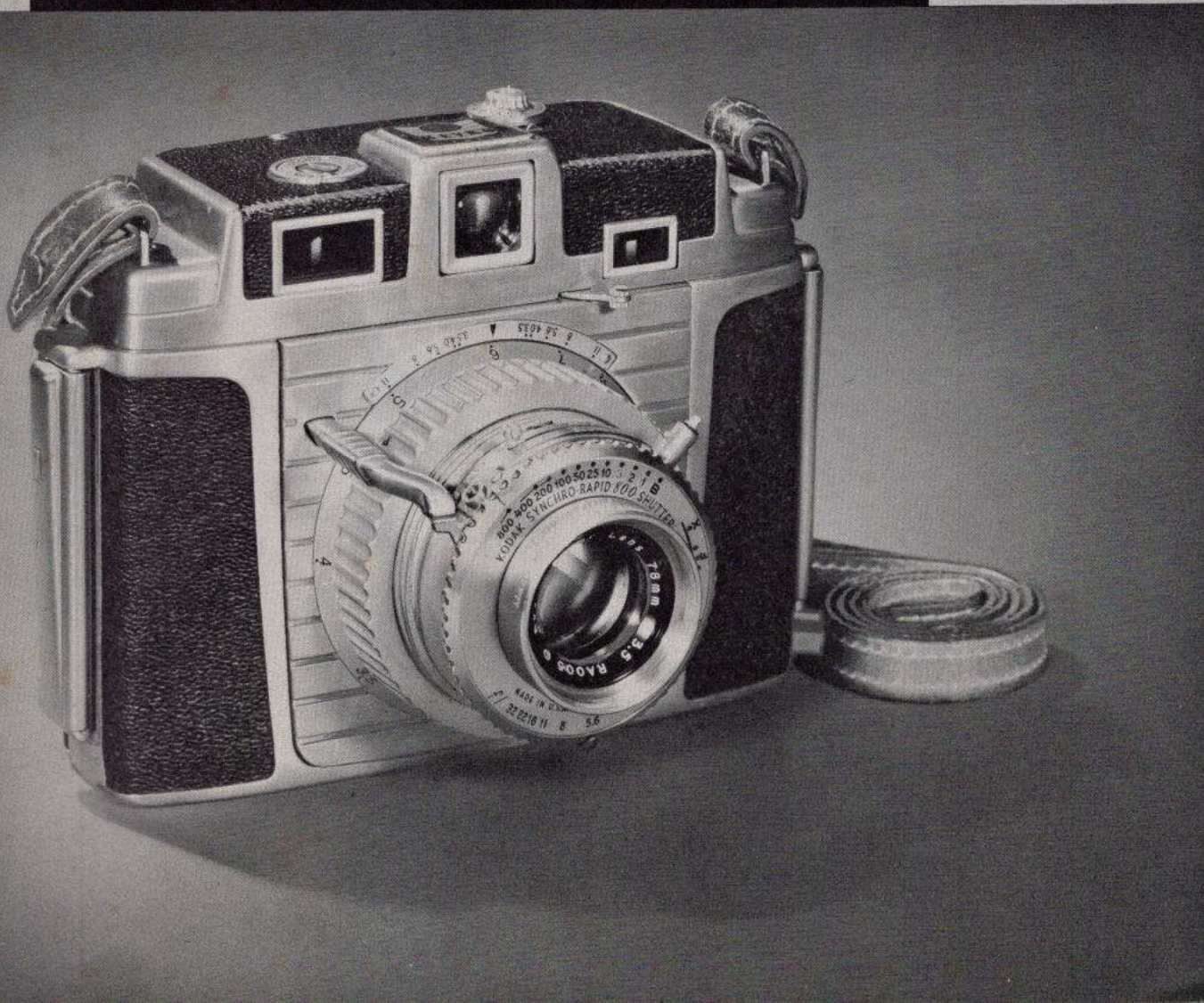


TABLE OF CONTENTS

Page

TROUBLE CHART 3

KODAK CHEVRON CAMERA

Disassembly 4
Reassembly and Adjustment 8
Range Finder Theory of the Kodak Chevron Camera (Instruction No. 54) .. 13
Range Finder Adjusting Charts (Instruction No. 55) 14
Range Finder Functional Adjustments (Instruction No. 56) 14
Range Finder Appearance Adjustments (Instruction No. 57) 15
Fitting Sports Finder Clip (Instruction No. 58) 15

SPECIAL TOOLS 16

This manual has been prepared as a guide for the experienced camera repair man. While it includes complete disassembly and reassembly, it is expected that the repair man will dismantle only those parts necessary to make the repair.

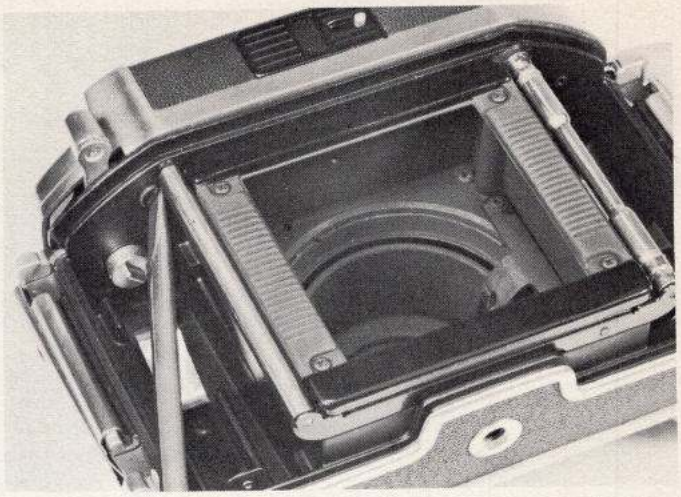
T.M. Reg. U.S. Pat. Off.

TROUBLE CHART

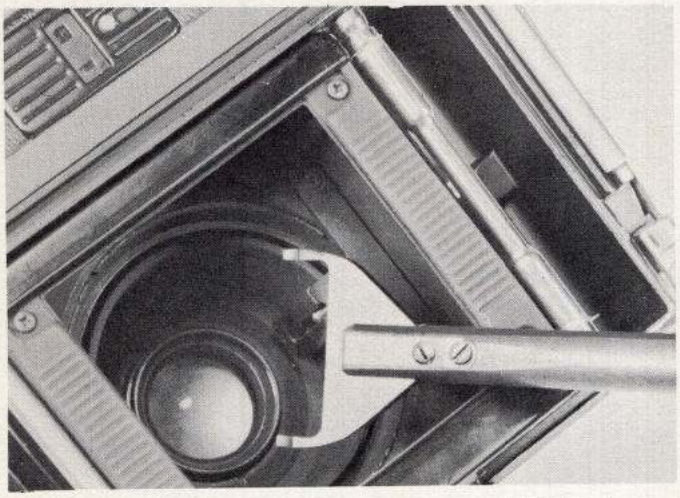
Trouble	Remedy
Focus scale binds	Check for trouble in the focus barrel guides (see Instruction No. 26). If trouble is located in the focus ring ball race, return the Camera to Rochester, New York.
Film does not meter properly	1. Check for broken teeth on film stop ratchet (see Instruction No. 32). 2. Replace the double film stop pawls with a single pawl and new spring (see the Kodak Chevron Camera Parts List, No. 5510). 3. Remove bind from counter dial. 4. Increase tension of film metering spur springs on camera back. 5. Remove bind from film advance lever.
Film wind lever slow in returning	Place winding lever spring on second bearing plate stud (see Instruction No. 14 for location).
Shutter troubles	Since the Kodak Synchro Rapid 800 Shutter is similar to the one used on the Kodak Tourist Camera, repair adjustments are also similar. (See Parts List No. 1-5250 and Service Manual S.M. No. 1-5250 for the Kodak Synchro-Rapid 800 Shutter.)
View finder automatic parallax does not operate	1. Check for view finder contact arm binding on front plate. 2. Increase contact tension of viewfinder assembly (see Instruction No. 47).
View finder parallax incorrect	Parallax can be adjusted by use of the adjusting screw (arrow 2, Instruction No. 47). Place ground glass on back frame of camera and center image of chart on ground glass. Check viewfinder for centering of chart with 828 mask in position. Adjust as necessary and seal screw.
Range finder not clear	1. Check for reflections in range finder. 2. Change the No. 4 mirror in the range finder housing to the late style mirror (old style mirror about 1/32" thick; late style about 1/16" thick). See Instruction No. 54, figure B. 3. Relieve tension of masks in range finder housing. (Usually the small mirror. See Instruction No. 4.)
Range finder not registering	1. Check for movable mirror bracket binding on pivot and replace pivot if necessary. (See Instruction No. 43.) 2. Check for movable mirror arm riding on top of cam. Adjust arm so that it is approximately in center of cam (see arrow in Instruction No. 45).
Range finder out of adjustment	See Instructions No. 54 through No. 57.
Lens out of focus	See Instruction No. 59.

DISASSEMBLY OF KODAK CHEVRON CAMERA

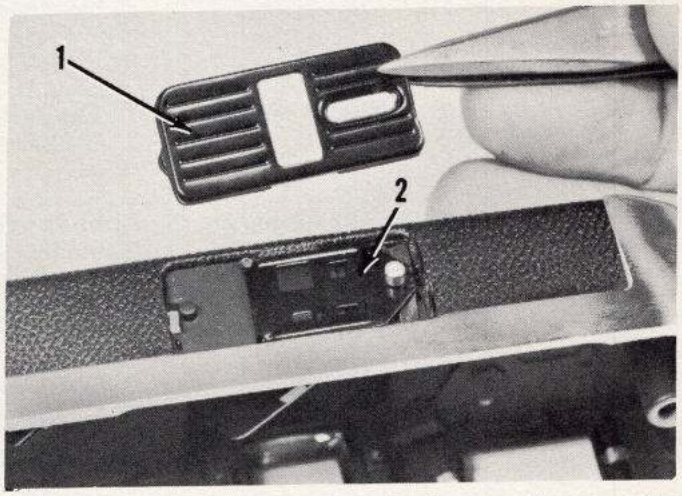
1. Remove the shutter trigger release screw and lift the release out of the socket.



4. Remove the left and right top housing screws located in the spool chambers and lift off the housing.

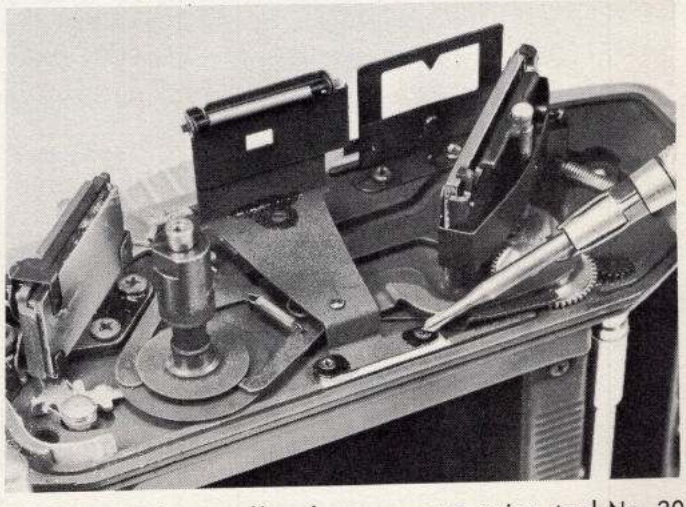


2. Set the focus ring to the Inf. position. Hold the shutter securely to prevent bending the tube guides and then remove the shutter retaining collar using tool No. 850.

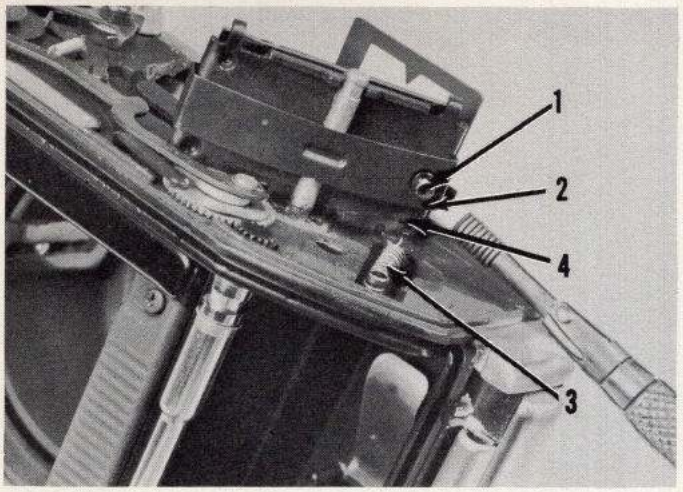


5. Lift the lugs of the rear eyelet frame and remove the frame (arrow 1), eye piece mask (arrow 2), lens tension mask, eyelet lens, and deviator lens (not shown).

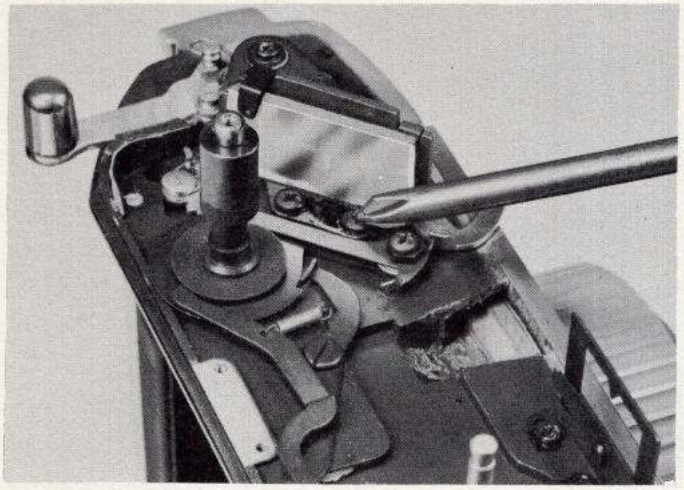
3. Set the finder mask (arrow 1) to the 828 position. Remove the exposure counter dial screw (arrow 2) and lift out the dial. To assist in reassembly note the location and number of washers under the dial.



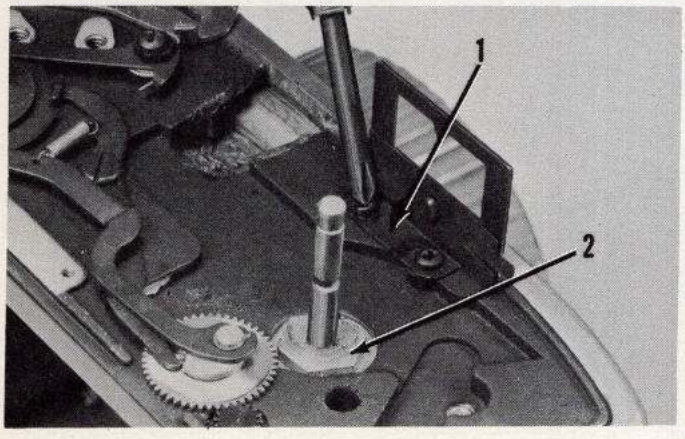
6. Remove the parallax frame screws using tool No. 30 and No. 887. Lift off the parallax frame assembly.



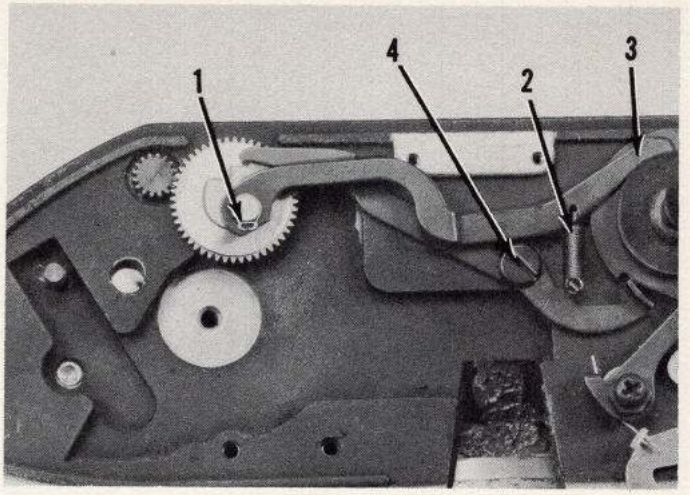
7. Remove the mirror adjusting screw (arrow 1), using tool No. 262, and lift off the mirror, the mirror clip (arrow 2), the movable mirror bracket spring (arrow 3), and the bracket spring (arrow 3), and the bracket assembly (arrow 4).



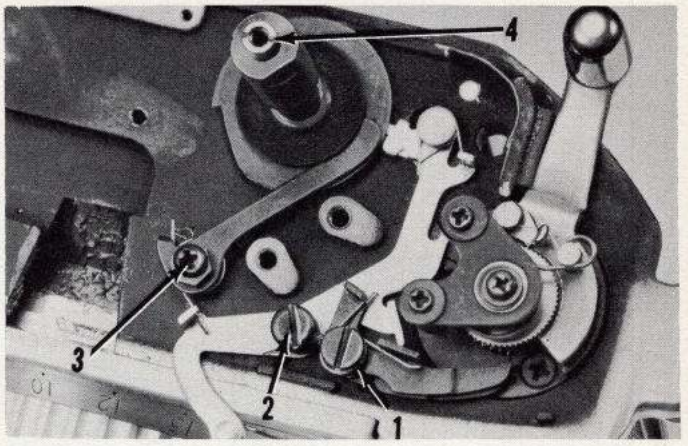
8. Remove the stationary mirror bracket screws and the bracket.



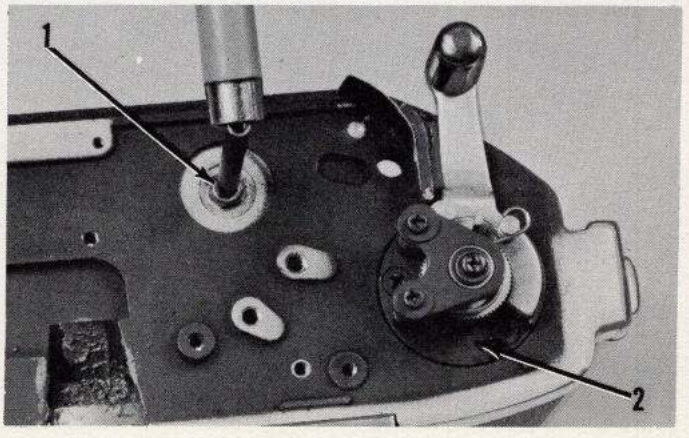
9. Remove the range finder adjusting mask assembly (arrow 1). Remove the movable mirror bracket pivot (arrow 2) with a 3/8" hexagonal nut driver.



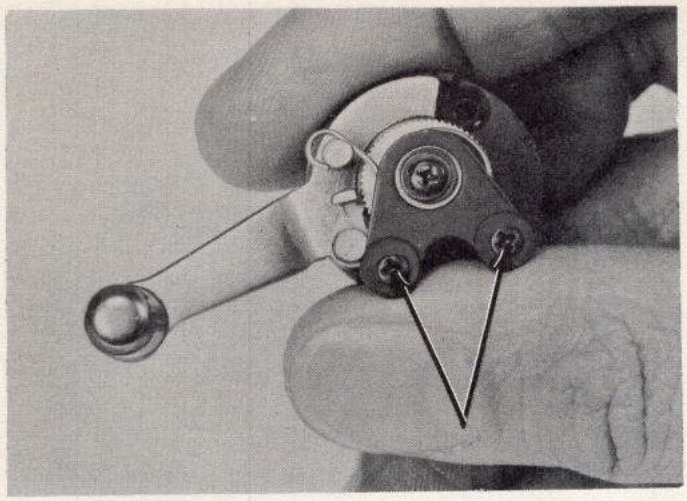
10. Remove the metering pawl retainer ring (arrow 1), the spring (arrow 2), the pawl (arrow 3), and the eccentric locking lever screw and lever (arrow 4).



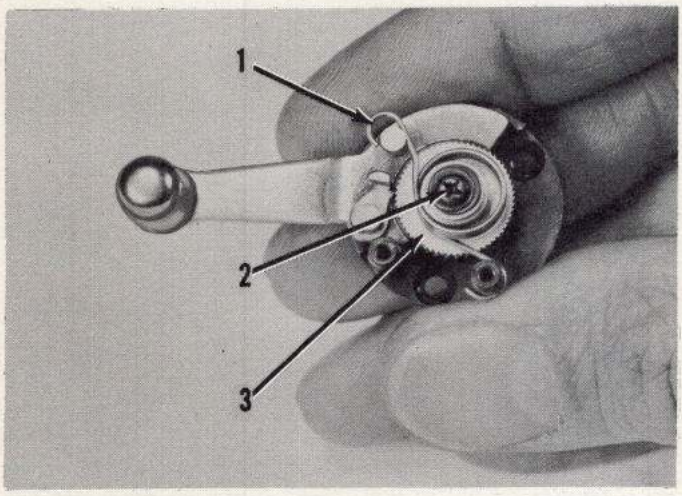
11. Remove the upper and lower film stop pawl springs (arrow 1), the screw, and the pawls (later style cameras have single pawl and spring). Remove the metering lever assembly screw (arrow 2) and the lever. Remove the hold back pawl screw (arrow 3), the eccentric nut, pawl, washer, spring, and the metering ratchet assembly screw (arrow 4) and the assembly.



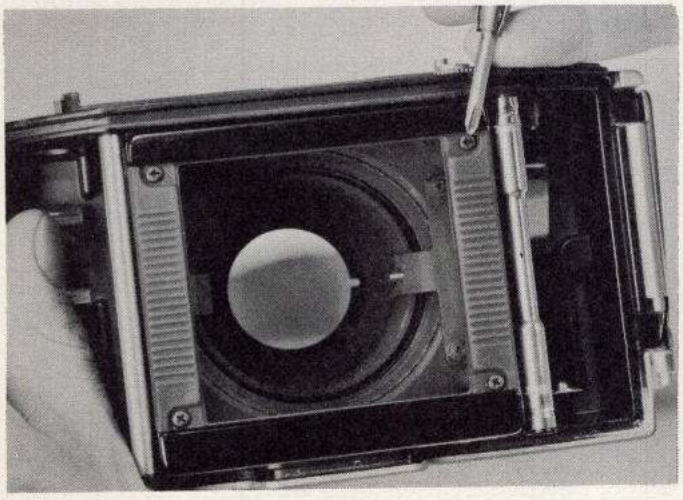
12. Remove the metering sleeve stud (arrow 1) with a 3/16" hexagonal nut driver. Remove the winding key assembly screws and the assembly (arrow 2).



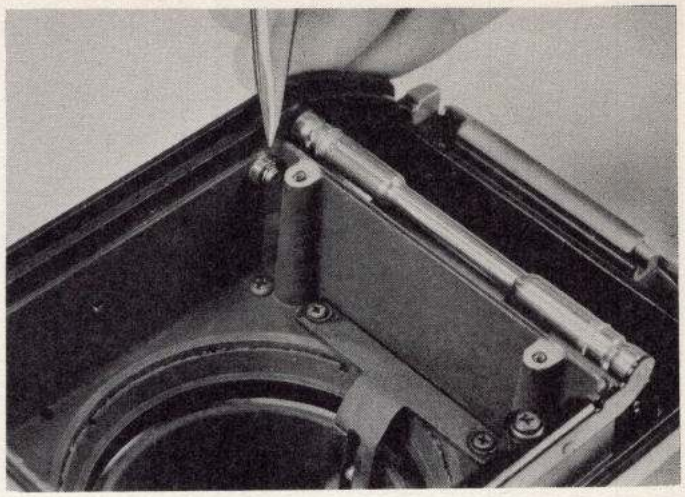
13. Remove the two bearing plate screws, washers, and the bearing plate (with late style key assembly it will be necessary to remove the wind post nut to lift out the bearing plate).



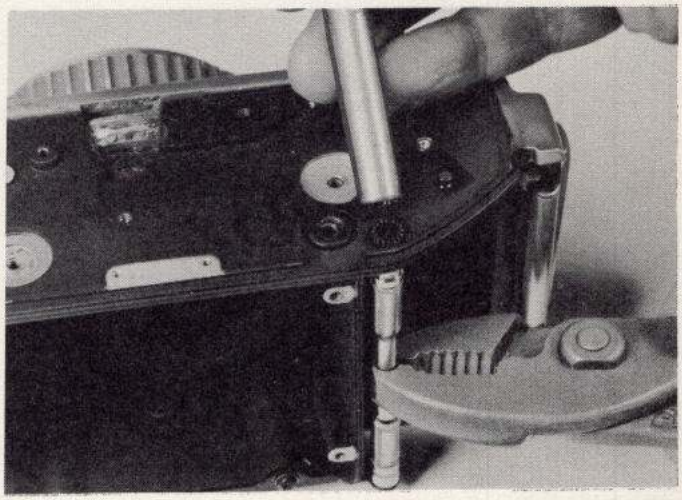
14. Remove the winding lever spring (arrow 1), the key post screw and washer (arrow 2) and the ratchets (arrow 3) (later style keys have a nut on key post). Remove the key post, the clutch spring and the clutch sleeve.



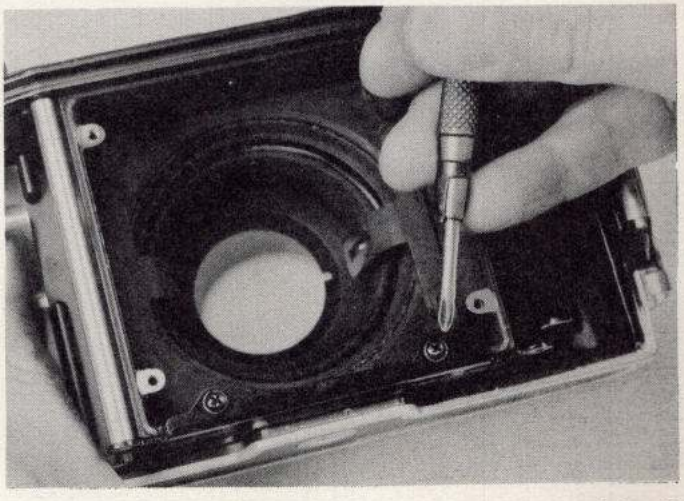
15. Remove the back frame screws and the back frame. To assist in reassembly, note the location and number of washers under the back frame.



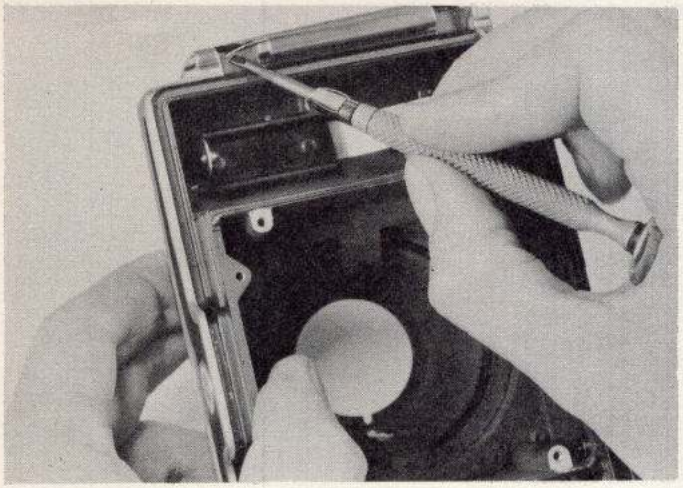
16. Remove the metering clutch assembly retainer ring and lift off the clutch assembly, located on the top of the camera.



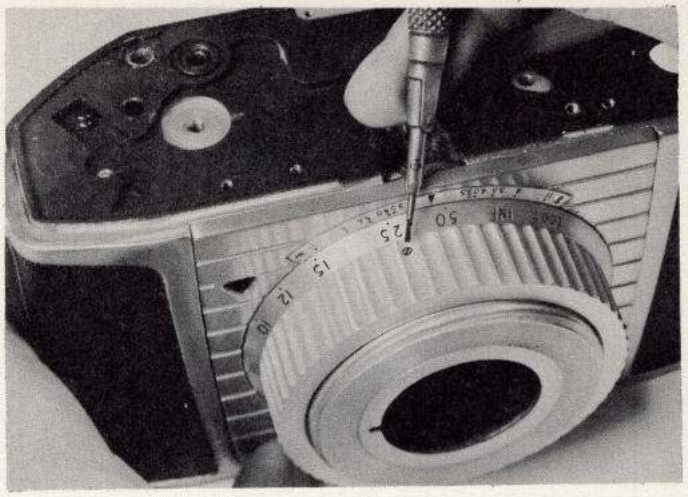
17. Hold the metering roller assembly with tool No. 881. Using tool No. 576, turn the pinion clockwise to remove it. This is a left-hand thread.



18. Remove the screws in the roller bracket and lift off the bracket and film roller.

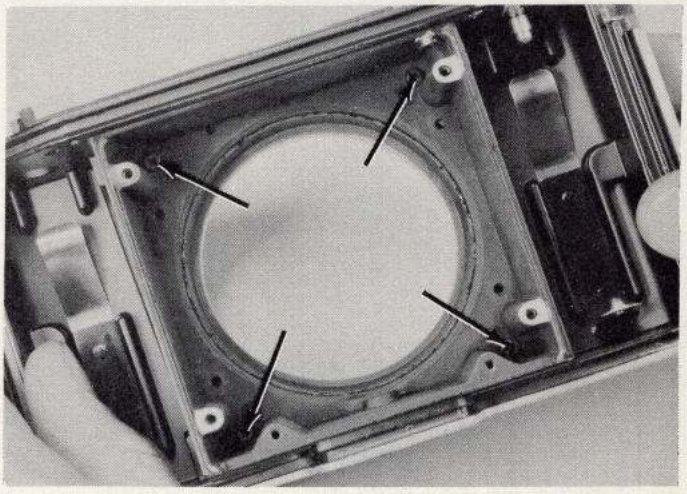


19. Remove the back latches by inserting a screw driver blade between the case and the spring. Then slide the latch and spring toward the bottom of the case.

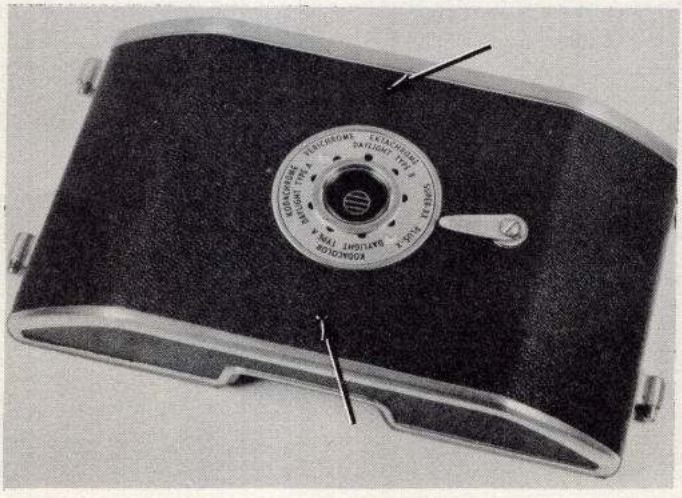


21. Loosen the three focusing collar screws and lift out the focus tube assembly.

20. To assist in reassembly, mark the tube guides. Then remove the right and left guides (left guide not shown).

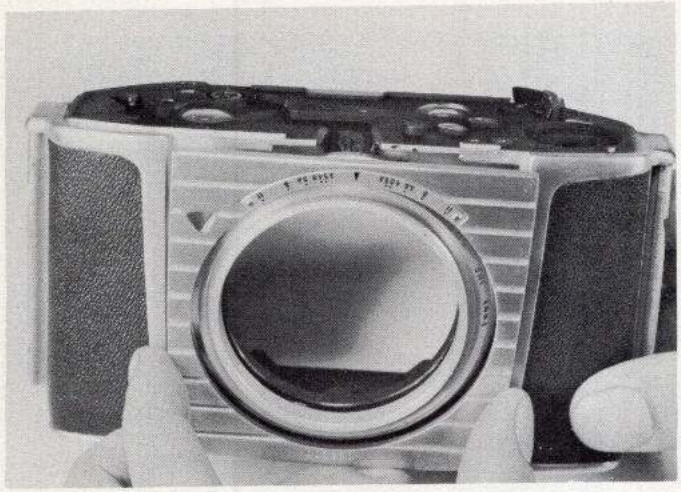


22. Remove the four front plate screws (arrows) and the front plate.



23. To disassemble the back, remove the two pressure pad rivets (arrows). (Refer to Parts List No. 5510).

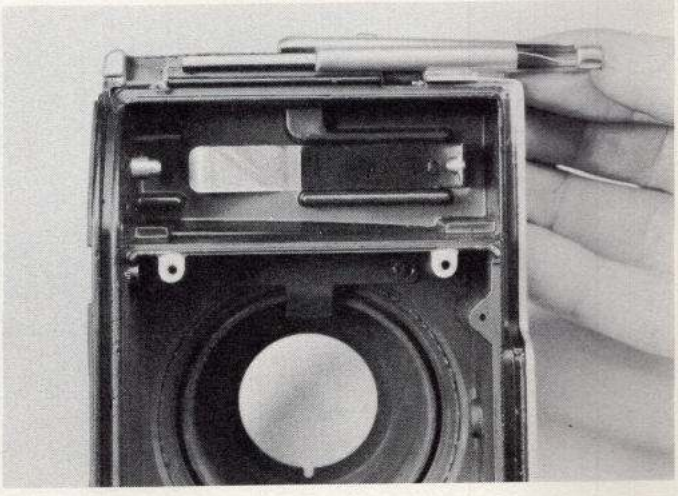
REASSEMBLY AND ADJUSTMENT



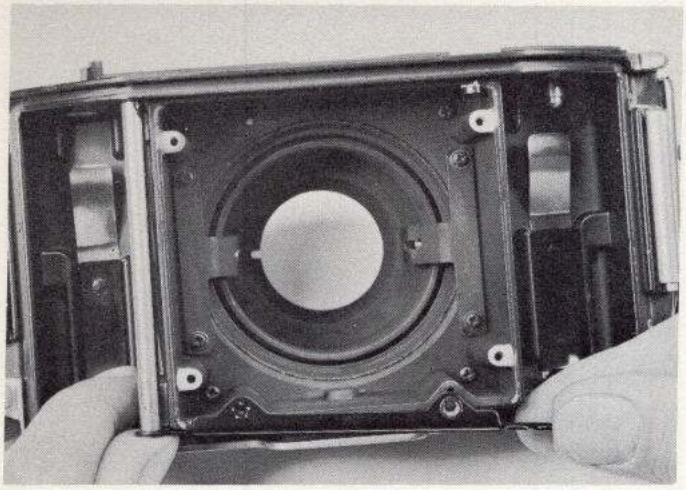
24. Replace the front plate and retaining screws.

26. Adjust the free side of the tube guides to remove play on focus barrel pins. Lubricate with grease No. 7101, or equivalent. Replace the tube guides in the case and align them to allow the focus ring to revolve through the entire range with no binding.

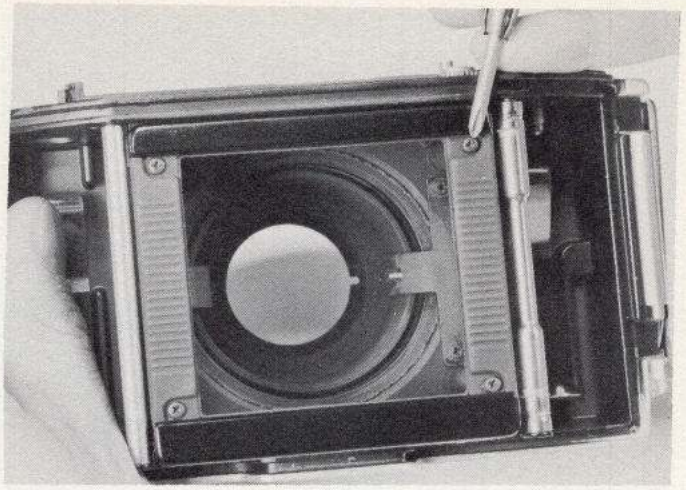
25. Clean the focus barrel assembly and lubricate the assembly with No. 7101 grease (available as part No. 760380), or equivalent. Then replace the assembly and the three assembly screws.



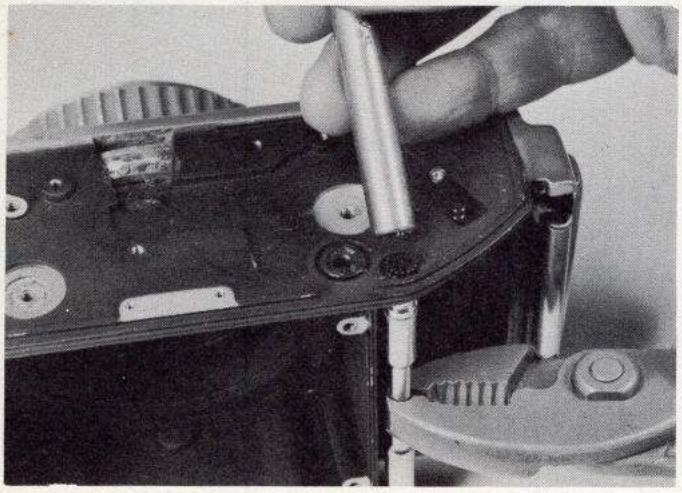
27. Replace the back latches by locating the spring in the latch and sliding the latch into position.



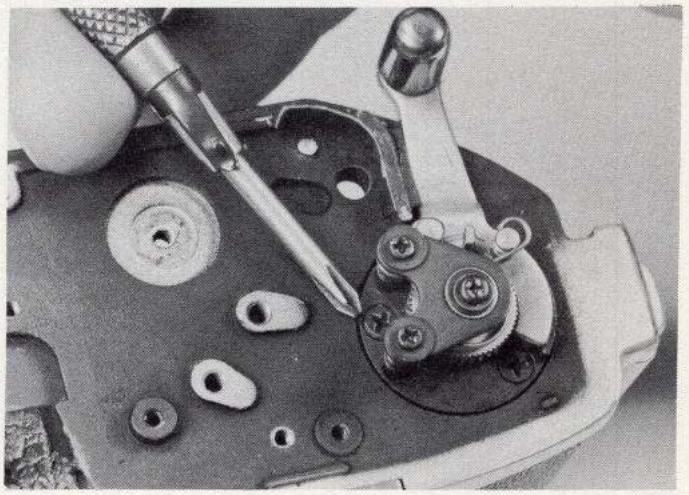
28. Replace the roller bracket, film roller, and the locating pin.



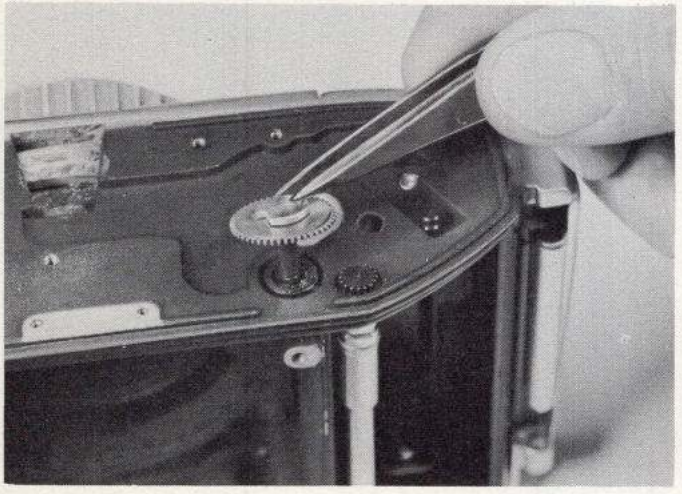
31. Replace the back frame washers and the back frame; then replace the back frame screws. The back frame should be parallel with the front surface of the focus tube. Tolerance is ±.001".



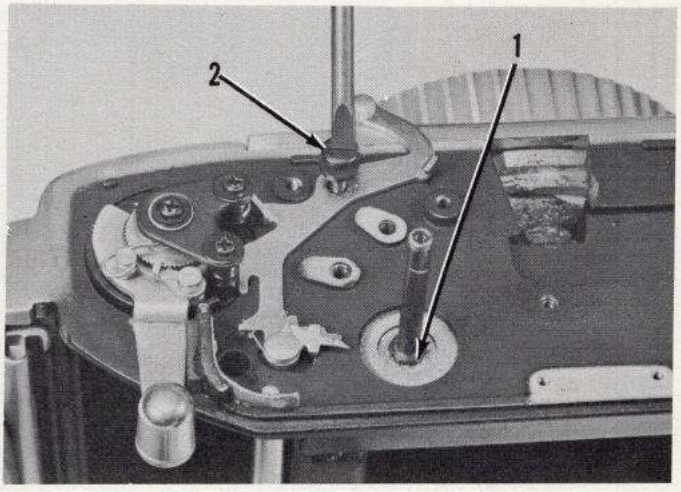
29. Lubricate the pinion with No. 7101 grease, or equivalent. Then replace the metering roller and pinion. Turn the pinion counterclockwise to tighten it.



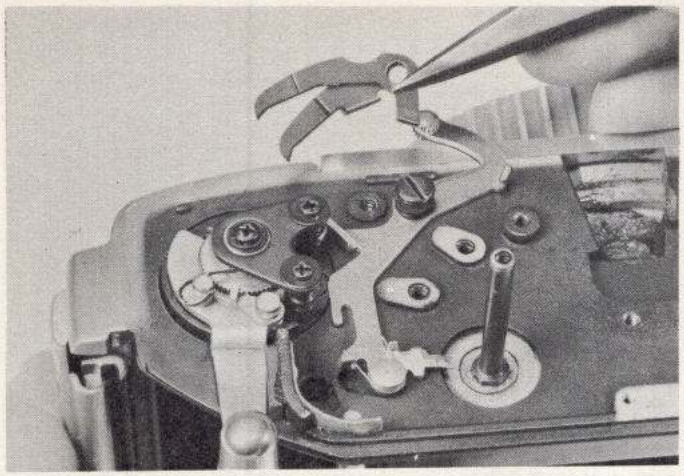
32. Check key assembly for clutch spring out of position and worn teeth on ratchet. If necessary, replace with kit, see Parts List No. 5510. Replace the key assembly and key assembly screws.



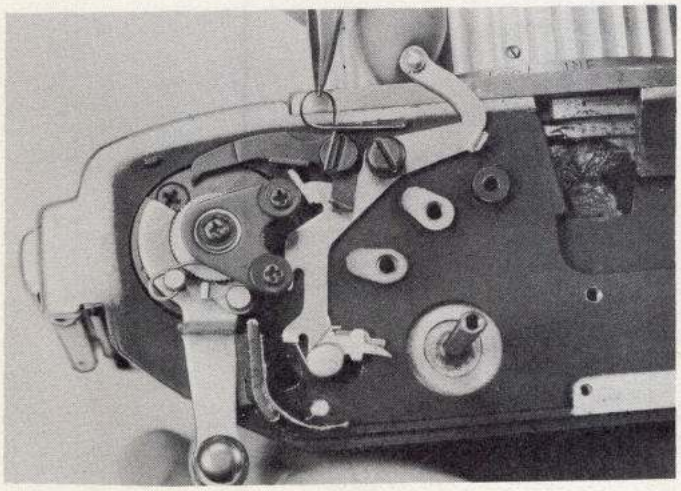
30. Lubricate the clutch shaft lightly with No. 7101 grease, or equivalent. Then replace the metering clutch assembly and the clutch retainer ring (see Instruction No. 16).



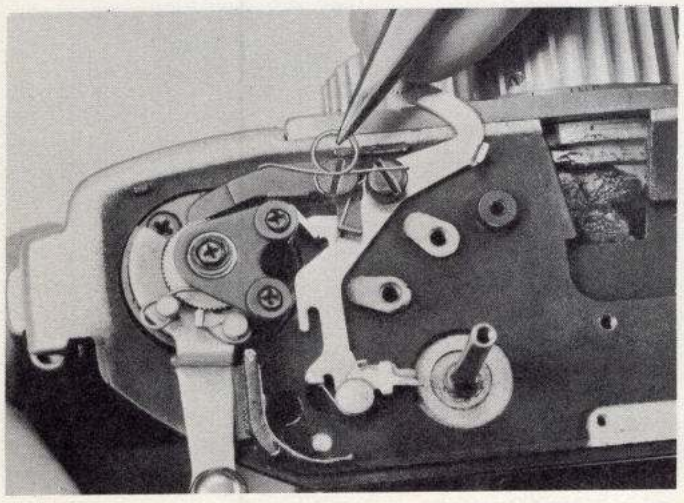
33. Replace the metering stud (arrow 1) and secure it with a 3/16" hexagonal nut driver; then replace the metering lever assembly and the assembly screw (arrow 2).



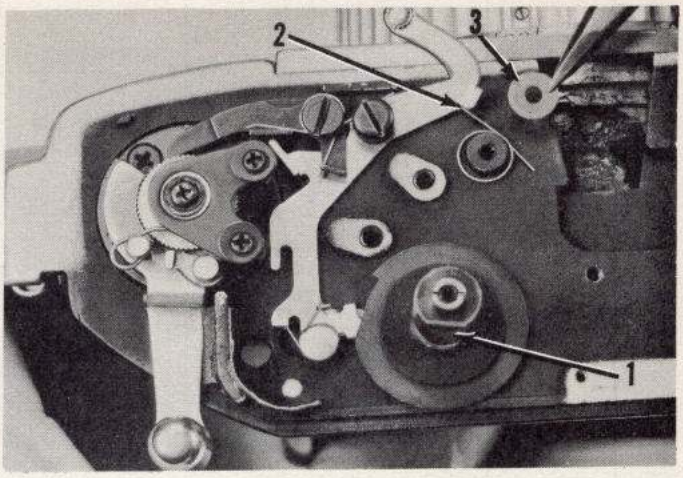
34. Replace the film stop pawls. If the pawls are defective, replace them with a late style single lever and new spring (see Parts List No. 5510).



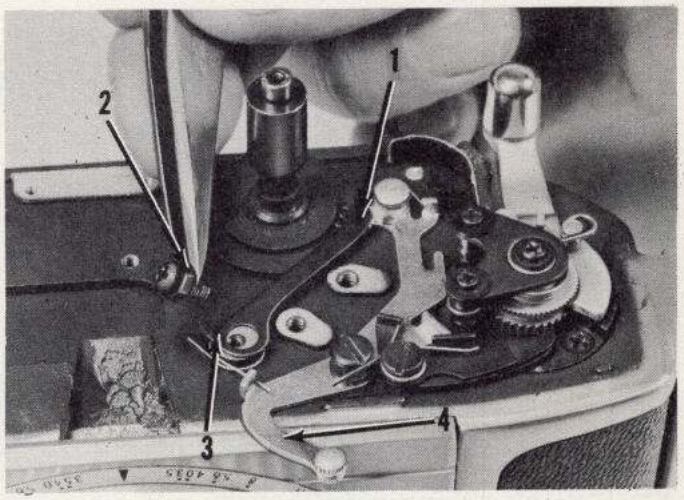
35. Replace the top pawl spring.



36. Replace the bottom pawl spring (refer to Parts List No. 5510 if late style spring and single lever are used).

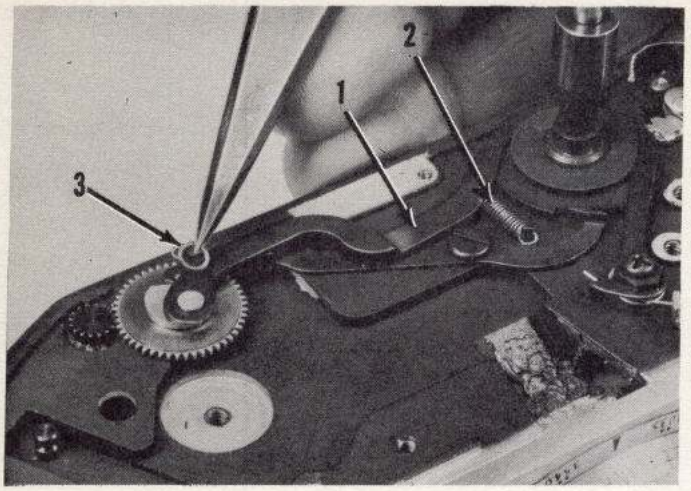


37. Replace the metering ratchet assembly and assembly screw (arrow 1), the hold-back pawl spring (arrow 2), and the washer (arrow 3).

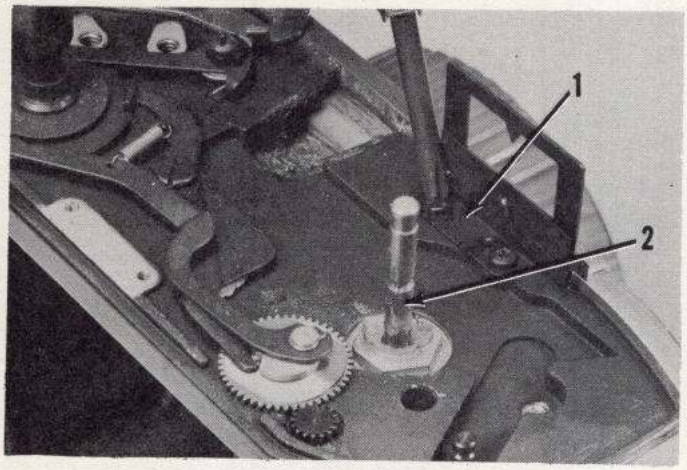


38. Replace the hold-back pawl (arrow 1), and the adjusting nut and screw (arrow 2). Then hook the short leg of the spring on the hold-back pawl lug (arrow 3), and the long leg of the spring on the metering lever assembly (arrow 4).

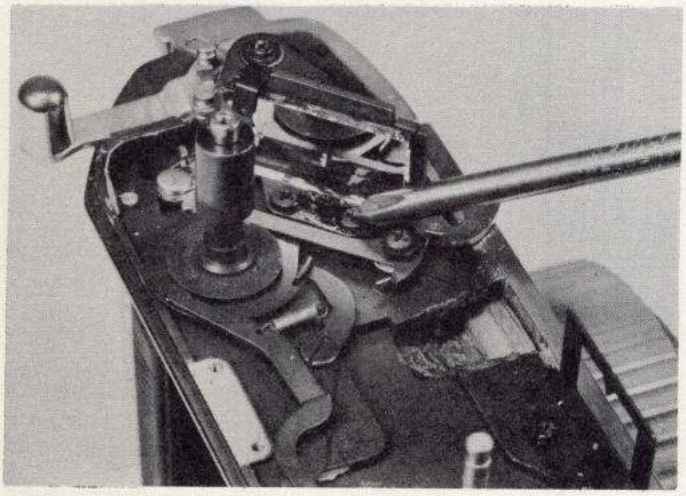
39. Replace the eccentric lock lever and lever screw.



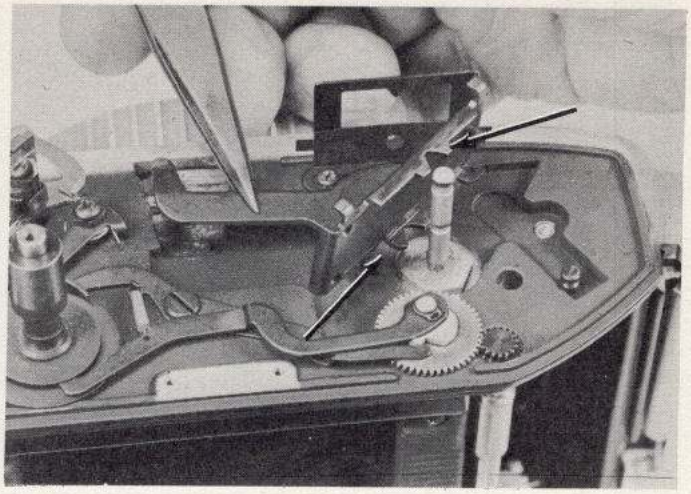
40. Replace the metering pawl (arrow 1), spring (arrow 2), and the retainer ring (arrow 3).



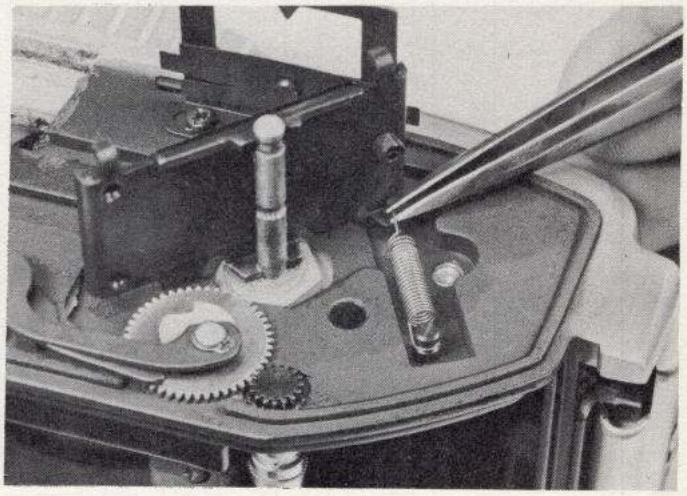
41. Replace the range finder adjusting mask assembly (arrow 1) (see paragraph 56, "Adjusting Pointer in Upper Field" and "Masking of Upper Field"). Then replace the movable mirror pivot stud (arrow 2) using a 3/8" hexagonal nut driver.



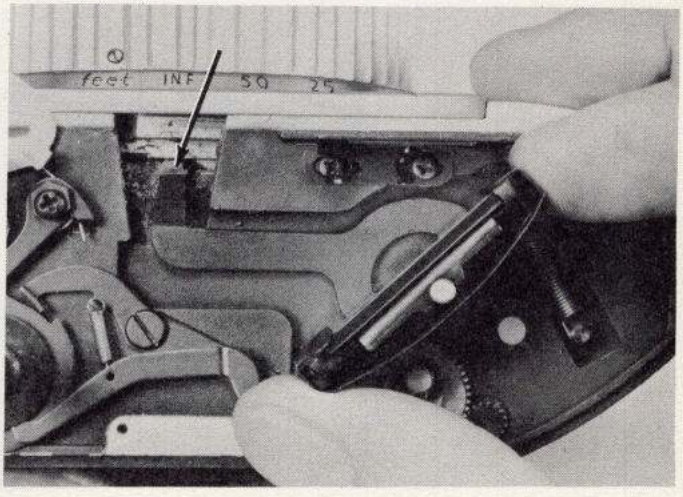
42. Replace the stationary mirror bracket assembly (see paragraph 56, "Adjusting Footage" 2(b) and "Adjusting Halving").



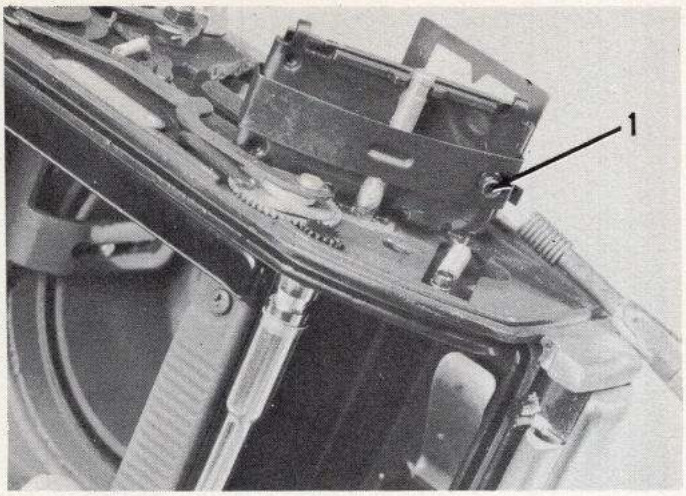
43. Lubricate the pivot points (arrows) of the movable mirror bracket with No. 7101 grease, or equivalent. Replace the bracket (see Instruction No. 45 for proper positioning of arm on cam (arrow).



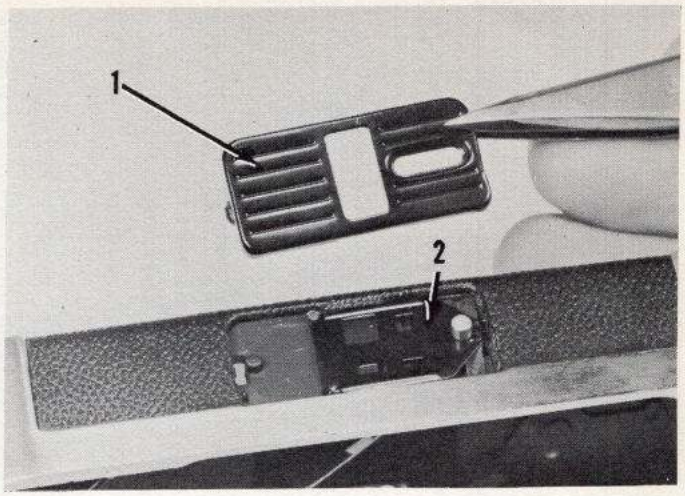
44. Replace the movable mirror bracket spring.



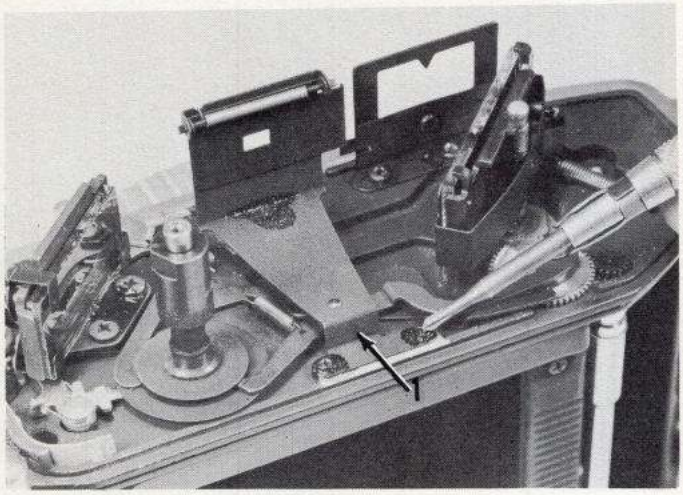
45. Replace the movable mirror and clip.



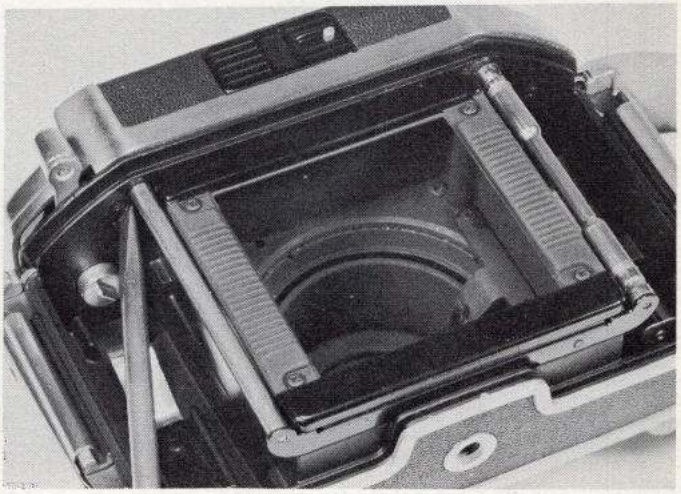
46. Replace the movable mirror adjusting screw (see paragraph 56, "Adjusting Footage 1 and 2 (a)).



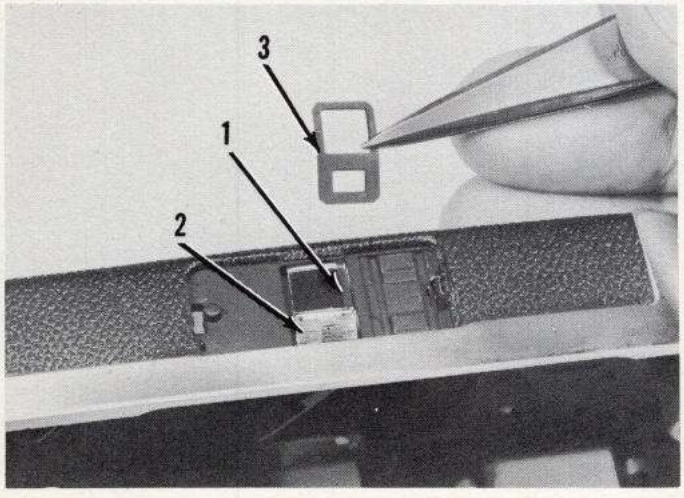
49. Replace the eye piece mask (arrow 2), and the eyelet frame (arrow 1).



47. Replace the parallax frame assembly. Increase the tension of the assembly, if necessary, by reforming it at the point indicated by arrow 1. Too much tension will cause horizontal movement of the frame.

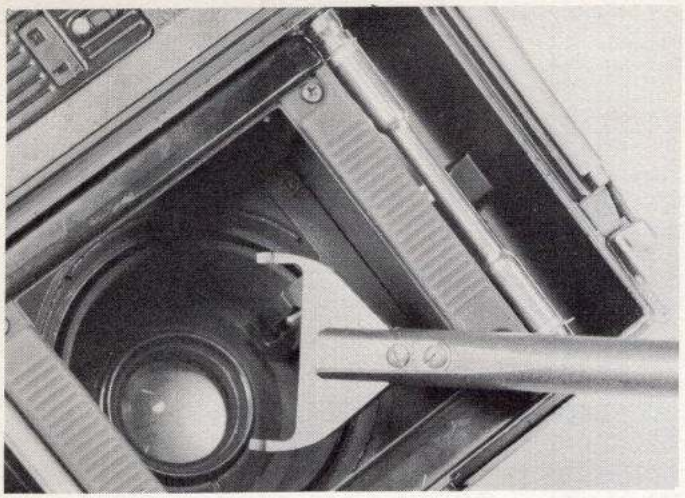


50. Set the finder mask to the 828 position. Then replace the top housing and the top housing screws (short screw on right side).

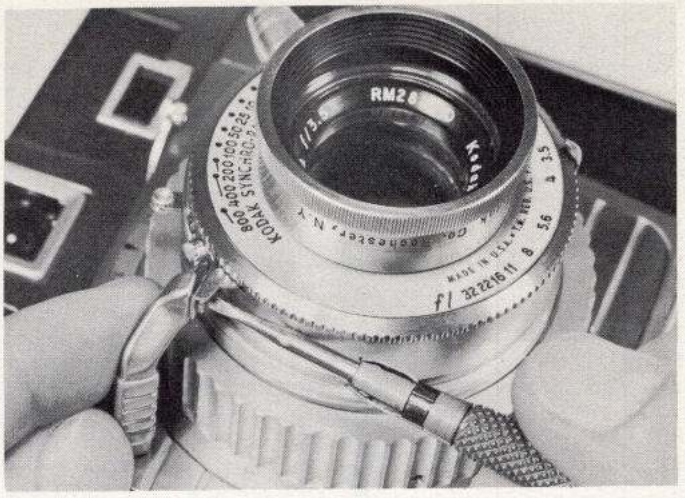


48. Replace the finder eyelet lens (arrow 1), plano side to rear, the deviator lens with right angle side to rear (arrow 2), lens tension mask (arrow 3).

51. Replace the counter dial washers (thick washer first); place the counter dial in position and secure it with the dial screw.



52. Set the focus ring to the Inf. position and replace the shutter. Hold the shutter securely to prevent bending the tube guides. Use tool No. 850 to replace the shutter retaining collar.



53. Place the shutter release in the socket and replace the shutter trigger release screw. (See Instruction No. 59 to refocus the lens.)

54. RANGE FINDER THEORY OF THE KODAK CHEVRON CAMERA

The optical system in this range finder is very similar to that in the Kodak 35 Range Finder Model, except that the range finder viewing window is moved over to a point directly beneath the view finder window. This is accomplished with two additional mirrors (in the range finder cover) whose only function is to position the range finder images on the view finder axis. Fundamentally, therefore, the range finder consists only of the two large mirrors on the camera body. (Figure A).

The Kodak Chevron range finder has been designed to show a blending of the two images rather than the more conventional sharp division. It is, therefore, impossible to obtain a sharp line between images without sacrificing other desirable characteristics of the range finder field.

In a correctly adjusted range finder, the upper and lower images will appear offset in the manner shown in Figure C. The principal characteristics of a well adjusted range finder are:

A. Equal offsets in the directions indicated.

B. An aligned vertical line through the pointer of the range finder field should also be in the center third of the view finder field. (See Figure D).

C. Upper and lower range finder fields of approximately equal heights.

D. The range finder field should be parallel to the view finder field.

E. The pointer should be located in the center of the upper range finder field.

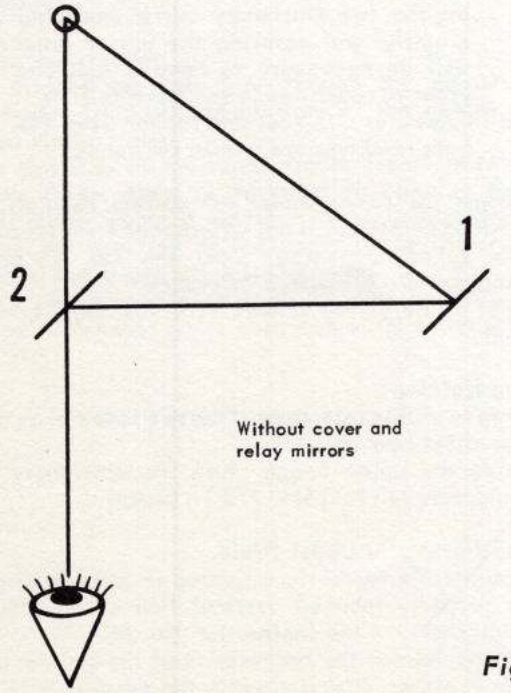


Figure A

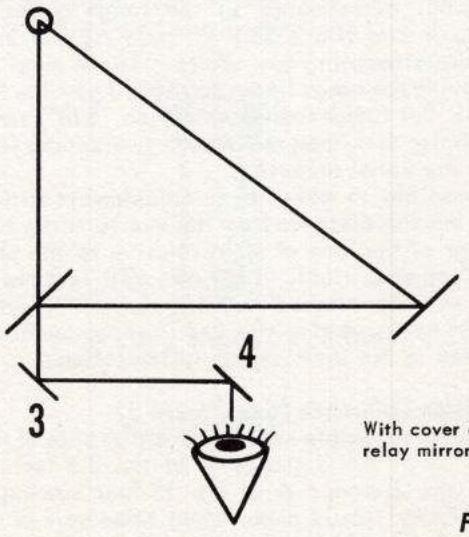
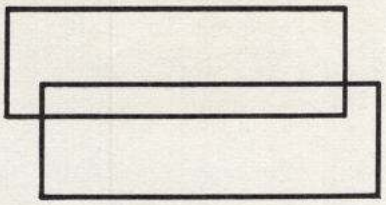
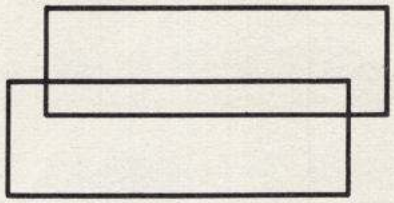


Figure B



When set on 'INF'



When set on '3.5'

Figure C

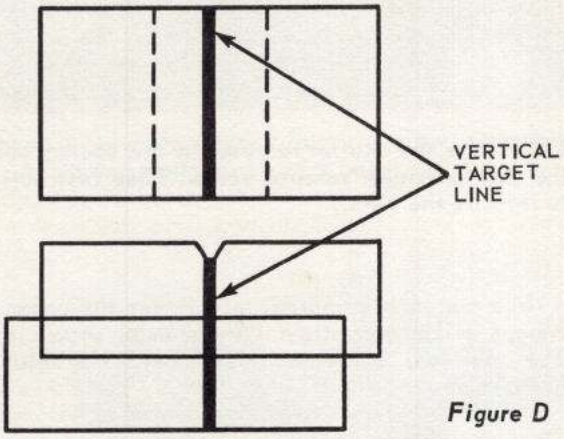


Figure D

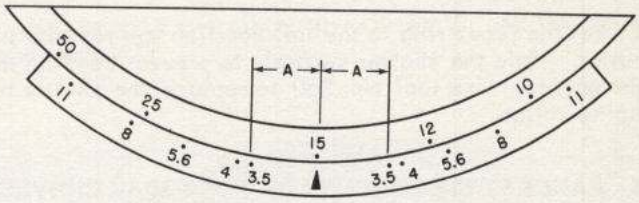


Figure E

55. RANGE FINDER ADJUSTING CHARTS

It is recommended that suitable focus charts be made and located at 3.5 feet and 15 feet from a fixed camera location. Distances should be measured accurately from the film plane of the camera, and the charts must be mounted so as to be centered on, and perpendicular to, the optical axis of the camera.

It has been found that a triangular focus chart with a vertical line added at the center, is sufficient for checking and adjusting the range finder.

56. RANGE FINDER FUNCTIONAL ADJUSTMENTS

Functional adjustments to the range finder concern mirrors No. 1 and No. 2 only (Figure A) and should be made before attempting any others. These must be made after removing the range finder top housing by the following procedure: Set finder frame control on "828", remove exposure counter dial, then remove the two screws located in the top of the spool recesses.

It is possible to make these adjustments with the unaided eye but the distance from the eye to mirror No. 2 and the position of the line of sight relative to the stationary mirror are rather critical. Tool No. 778 is a top housing provided with an aligned viewing tube and cutouts for most of the adjustments. Its use is recommended and is presupposed in the instructions which follow.

Range Finder Tolerance (See Figure E)

Maximum permissible scale error either side of the scale pointer is .6 of the distance A at the 3.5-foot setting, and .4 of the distance A at the 15-foot setting. Alignment at infinity should occur when some part of the mark "INF" is opposite the pointer.

Adjusting Footage

1. Train the camera on an infinity object (preferably vertical) and rotate the focusing ring to the INF stop. Adjust the movable mirror screw with Tool No. 262 to align the images; *in* to move upper image to the right (tool No. 778 in place).
2. Train the camera on the 3.5 foot chart and align the images by means of the focusing ring. If the 3.5-foot mark is not within tolerance, proceed as follows:

   (a) Turn the movable mirror adjusting screw about one full turn; *in* if the 3.5 foot mark is to the right of the index mark (tool No. 778 in place).
   (b) Rotate the focusing ring to the INF mark and align the images of an infinity object by loosening the two stationary mirror mounting screws slightly and rotating the mirror bracket. (It will be necessary to remove tool No. 778 in order to reach these two screws.)
   (c) Check at 3.5 feet and repeat step No. 2 until both readings are within tolerance.

3. Check the range finder for correct reading on the 15-foot chart, and if not within tolerance repeat step No. 2, as necessary, until the 3.5, 15 and INF readings are all within tolerance.
4. Seal all adjusting screws with Vulcolac, or equivalent.

Adjusting Halving

Halving is within tolerance if the two sides of an aligned triangular chart line up.

To raise the upper image, turn the stationary mirror adjusting screw *in* (tool No. 778 in place).

Adjusting Pointer in Upper Field

The pointer is correctly adjusted if it is in alignment with the properly focused vertical line of an accurately positioned chart. (See Instruction No. 55.)

To adjust, loosen the two screws of the pointer bracket and slide it either direction until the pointer is in proper

alignment. A change of pointer position will require re-adjusting the footage. Seal screws with Vulcolac, or equivalent. (It will be necessary to remove tool No. 778 in order to reach these two screws.)

Masking of Upper Field

The upper and lower fields should blend with each other, rather than have a sharp division. The bottom edge of the upper field should also be parallel to the top edge of the lower field.

Correction is made by means of the slide located on the pointer bracket which must be sealed after any adjusting. (It will be necessary to remove tool No. 778 in order to reach the slide.)

57. RANGE FINDER APPEARANCE ADJUSTMENTS

The principal characteristics as described in Instruction No. 54 are determined somewhat by the functional adjustments made to the range finder, but are mainly determined by the appearance adjustments. Therefore, it is important that any corrections for appearance be made after it has been determined that the range finder is functioning properly. The various adjustments listed here are all made to the two mirrors located in the range finder cover (No. 3 and No. 4, Figure B), and it is necessary to use the cover that will be assembled to the camera.

Each of the mirrors has a primary and secondary effect on the appearance of the range finder fields, and some balancing between the two will be necessary. Since it may be necessary to remove and replace the cover several times while adjusting, it is recommended that two of the cover screws (part No. 126202 and No. 126203) be altered, as shown in Figure F, to be assembled in the cover as guide pins.

Offset Adjustment

The upper and lower fields should appear offset substantially the same distance in each direction as shown in Figure C.

The position of the upper field in relation to the lower field is changed by bending the large (No. 3) mirror about a vertical axis. Secondary effect: Changes the position of the upper field in relation to the view finder field.

Position Adjustment

An aligned vertical line through the pointer of the range finder field should also be in the center third of the view finder field.

The position of the range finder fields in relation to the view finder field is adjusted by bending the small (No. 4) mirror about a vertical axis. Secondary effect: Changes the position of the upper range finder field in relation to the lower range finder field.

It is recommended that offset and position adjustments be alternated until both characteristics are satisisfied.

Height and Blending Adjustment

The upper and lower fields should be of approximately equal height and also should blend together rather than have a sharp division between them.

The height of the upper field in relation to the lower field is changed by bending the large (No. 3) mirror about a horizontal axis. Secondary effect: Tilts the upper field.

Tilt Adjustment

The range finder field should be parallel to the view finder field.

The tilt of the range finder field in relation to the view finder field is adjusted by bending the small (No. 4) mirror about a horizontal axis. Secondary effect: Changes height of upper field in relation to the lower field.

It is recommended that height and blending and tilt adjustments be alternated until both characteristics are satisfied.

Pointer Adjustment

If the pointer has been adjusted as described in Instruction No. 56 and the other characteristics corrected as previously described, no further adjustments to the pointer will be necessary.

58. FITTING SPORTS FINDER CLIP

On cameras above Serial No. 3400, the three holes for accepting the finder shoe are pre-drilled and tapped. These holes are directly to the rear of the name plate, and covered with the leather covering.

On cameras below Serial No. 3400, it will be necessary to drill and tap the holes. The finder shoe supplied with the Kodak Chevron Sports Finder Kit can be used as a template by holding it in correct mounting position while drilling with a No. 50 (.070) drill. Tap the drilled holes with a No. 2-56 (R.H.) tap.

59. ADJUSTING FOCUS

Check the focus on a 15' chart. Use ground glass with the ground side toward the lens and on the film rails of the back frame. Turn the focusing ring until the lens is focused for best definition in the center of the picture area. Loosen the three screws on the focusing collar and align the 15' scale reading with the index mark without turning the focus ring (see Instruction No. 31).

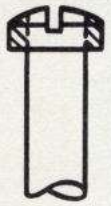
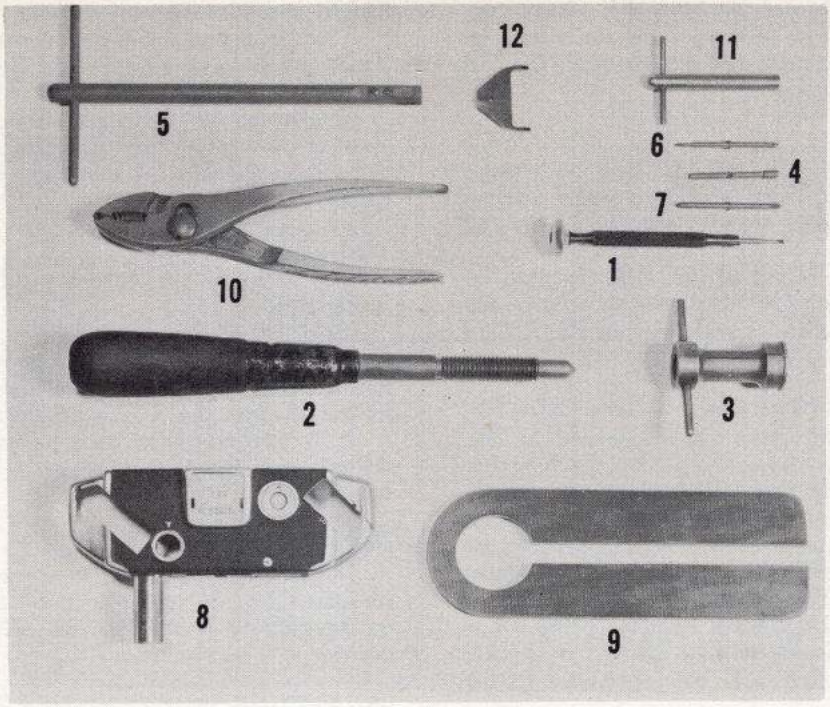


Figure F

REMOVE SHADED PORTION



SPECIAL TOOLS

Index No.	Tool No.	Name
1	30	Jeweler's screw driver
2	84	Handle for No. 256 expansion tool
3	256	Expansion tool for removing rear lens
4	262	Hexagonal socket for No. 30 screw driver
5	650	Handle for shutter retaining collar wrench
6	887	Fulcross blade for No. 30 screw driver
7	681	Phillip's blade for No. 30 screw driver
8	778	Range finder fixture
9	880	Fiber wrench for front lens
10	881	Special pliers for metering roller
11	576	Pinion gear wrench
12	850	Shutter retaining collar wrench

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3-55-GLP-B

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